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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/020,747	11/30/2001	Tiecheng A. Qiao	82429D-W	9726

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EXAMINER

BISSETT, MELANIE D

ART UNIT

PAPER NUMBER

1711

DATE MAILED: 05/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

5

Office Action Summary

Application No.

10/020,747

Applicant(s)

QIAO ET AL.

Examiner

Melanie D. Bissett

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 14-18 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-7, 10-12, and 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zyomyx, Inc. in view of Marks et al. Zyomyx (WO 00/04382 A1) can be found on the applicant's Form PTO-1449.
3. Zyomyx discloses protein arrays comprising a substrate, an organic thin film, and proteins immobilized on the thin film (p. 5 lines 6-12). The substrates may be coated before the addition of the organic thin film (p. 19 lines 20-29), where the organic thin film is preferably a monolayer having the formula X-R-Y which fits the applicant's trifunctional compound (p. 22 lines 8-20). The linking group R preferably comprises an alkyl chain having from 8-22 carbons, suggesting through-bond paths connecting the functional groups of not greater than 10 atoms (p. 25 line 27-p. 26 line 5). The functional group X interacts with the substrate or coated substrate by chemical or physical means, where X includes isothiocyanate and isocyanate groups (p. 26 lines 14-22). Functional group Y interacts with a protein by covalent or non-covalent linkage, where Y includes aldehydes, maleimides, iodoacetyl, hydrazide, epoxy, aziridine, vinylsulfone, isothiocyanate, and isocyanates groups (p. 28 line 9-p. 29 line 9). Additionally, an affinity tag attached to the Y functional group include glutathione S-

transferase or streptavidin groups (p. 33 lines 19-21). Antibodies, known protein capture agents, are noted as proteins to be immobilized on the thin film (p. 33 lines 1-11). A plurality of proteins are attached to different patches on the substrate (p. 5 lines 1-25). However, the reference does not point to gelatin as a coating substance for the substrates. Marks teaches protein assays using coated substrates, teaching the conventionality of coating gelatin on substrates to reduce non-specific binding (col. 32 line 59-col. 33 line 5; col. 33 lines 39-43). Such coatings also simplify covalent conjugation and enhance signal detection. Because Zyomyx is also concerned with non-specific binding (p. 12 lines 17-19), it is the examiner's position that it would have been prima facie obvious to include a gelatin on Zyomyx's substrate to reduce non-specific binding, simplify covalent conjugation, and enhance signal detection.

4. Regarding the coating coverage of gelatin on the substrate, it is the examiner's position that it would have been prima facie obvious to coat any amount necessary to optimize the non-specific binding, covalent conjugation, and signal detection properties of the coating.

5. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zyomyx, Inc. in view of Marks et al. as applied to claims 1-7, 10-12, and 14-18 above, and further in view of *Kirk-Othmer Encyclopedia of Chemical Technology*.

6. Zyomyx and Marks apply as above, failing to mention the type of gelatin used in the coating. The *Kirk-Othmer Encyclopedia of Chemical Technology* teaches first that type B gelatin, produced by alkaline processing, has a more reproducible isoionic point

(section 3.3). The isoionic point is important in reducing viscosity (section 3.4), which eases processing. It is the examiner's position that it would have been prima facie obvious to use type B gelatin, being alkaline pretreated, because of its reduced viscosity to ease the processing of coatings in the invention of Zyomyx and Marks.

7. Also, *Kirk-Othmer Encyclopedia of Chemical Technology* notes pork skin as a conventional source for both types A and B gelatin (section 4), where pork skins yield large amounts of gelatin. It is the examiner's position that it would have been prima facie obvious to choose pig gelatin in the invention of Zyomyx and Marks, since pig gelatin is readily available. Motivation for choosing pig gelatin would have been to maximize the amount of gelatin obtained from the source.

Allowable Subject Matter

8. Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Claim 13 limits a method of making a gelatin-based substrate to comprise a step, where a trifunctional compound is affixed simultaneously with a gelatin coating. The closest prior art, Zyomyx, discloses a method of making a protein array, where a coating is deposited or formed prior to the formation of an organic thin film that fits the applicant's formula of claim 12. The coating methods employed do not suggest the simultaneous formation coating of the gelatin and organic thin film layers, and the reference does not suggest the blending of the coating and organic thin film layers. It is

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the examiner's position that the applicant's claimed method, including the simultaneous coating of gelatin and trifunctional compound, would provide a novel and unobvious step over the prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie D. Bissett whose telephone number is (703) 308-6539. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (703) 308-2462. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

mdb
May 1, 2003

James J. Seidleck
Supervisory Patent Examiner
Technology Center 1700